

President of the
Royal College of Physicians
Edinburgh,
N W Morrison's Comp^t

VENTILATION AND VITALITY.

[Read at the Meeting of the British Association on Aug. 3, 1871.]

MR PRESIDENT,

At the Meeting of the British Association at Exeter, Professor Archer very kindly read for me a Paper descriptive of my System of Ventilation applied to dwelling-houses. To-day I intend to call your attention to other applications most intimately connected with sanitary science.

In carrying out my System, I have had forced on my conviction the very close relationship between Ventilation and Vitality, which form the subject of this Paper. That the relation may more clearly appear, I shall, with your kind permission, read to you, from page 219 of the Association's Transactions of 1869, the short outline of my System by the Editor:—

“The main features of this novel system of warming and ventilating consist in so circulating pure fresh air (through a warming chamber) into the room, and of foul air (through the fire) into the chimney, that all local currents are resolved into *one*, which, describing an unbroken circuit, forms an upper warmer current from the fire to the opposite wall, and an under colder current (under the floor) from the wall back again to the fire, when, after supporting combustion, the products escape up the chimney. The vacuum thus produced by the warmer current through the chimney, creates the now colder current from the atmosphere, which, passing through the heating-chamber, supports the respiration of any number of individuals.”

From this extract you will readily perceive that, imitative of nature, I produce, by mechanical means, an *artificial trade-wind*. Commingled with this air in motion, I propose to carry, in a circuit and by a current, the conditions of life to plants and animals, *firstly*, by an *outward current* from any centre to any circumference, to carry the conditions of life *to* them; and, *secondly*, by the veins of the *returning current* of the circuit, to remove *from* them their exhalations.

For several years I have had in contemplation the carrying out of such a system, in exact imitation of the currents of the atmosphere and the circulation of the blood; and reflecting over the fact that one grain of musk has been known to perfume a room for thirty-

six years without sensibly losing weight, it occurred to me to take advantage of this extreme divisibility of matter in nature, and by copying her in other respects, to carry, by artificial appliances, all such substances as by solution in spirit, water, or other simple mediums, can be so divided, and consequently evaporable into any current of air passing over them.

Acting on this thought, to carry, by a current of purified air, any amount of required heat, moisture, or medicine, *to* the lower animals, and *from* them their exhalations, I submitted, at the last meeting of the Highland and Agricultural Society of Scotland, my proposal to the test of the judges, and had the satisfaction of being by them awarded the Society's medal. Encouraged by this mark of approval of my efforts, I have built an addition to my house, so that one room, in particular, may be placed at the service of the medical profession, to test, by actual experiments on climate, the power of pure, fresh air, chemically-pure water, heat, light, and exercise on the human system.

Through this room a *general current* of air passes and commingles; consisting of a purified and warmed current across the entire floor, rising to meet a descending cooler and purified current from the entire ceiling; these having intermingled, support respiration, and then pass, by a ventilating shaft, to be burned in the fire. After thus supporting combustion

the products pass into the chimney. Into this general current I can at will diffuse, by a branch circulation, a second current, which, having passed through a solution of any medicine, joins the main current, and is now inhaled as perfumes are from flowers.

To give the British Association an opportunity of inspecting, on the spot, the mechanical arrangements by means of which I propose to carry out my views, and to receive from the Association such kind suggestions as may tend to the advancement of science, is the simple object of this paper. Should the Association think my efforts even one step in the right direction, nothing will give me greater pleasure than to read, at their next meeting, another paper fully descriptive of the *completed* mechanical arrangements, which I hope will also include a detailed series of experiments by the medical profession, which I hereby most cordially invite them to make, any time after the present meeting and before the next.